Crosstalk: Inflammation in Parkinson's disease (PD) in a humanized in vitro model

Grant Award Details

Crosstalk: Inflammation in Parkinson's disease (PD) in a humanized in vitro model

Grant Type: Early Translational II

Grant Number: TR2-01778

Project Objective: The project objective is to develop a human in vitro co-culture model of Parkinson's disease and demonstrate the feasibility of using this model to validate a target nuclear receptor, Nurr1, and screen for anti-inflammatory compounds that could be neuroprotective. Another objective is to correlate discoveries in the in vitro model to the large body of patient data that will be collected by the Partner PI.

Investigator:

Name:	Fred Gage
Institution:	Salk Institute for Biological Studies
Type:	PI

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Name:	Jürgen Winkler
Institution:	Universitätsklinikum Erlangen
Type:	Partner-PI

Disease Focus: Parkinson's Disease, Neurological Disorders

Collaborative Funder: Germany

Human Stem Cell Use: iPS Cell

Cell Line Generation: iPS Cell

Award Value: $2,472,839

Status: Closed

Progress Reports

Reporting Period: Year 1

View Report

Reporting Period: Year 2

View Report

Reporting Period: Year 3

View Report

Grant Application Details

Application Title: Crosstalk: Inflammation in Parkinson's disease (PD) in a humanized in vitro model

Public Abstract: Parkinson's Disease (PD) is the most common neurodegenerative movement disorder. It is characterized by motor impairment such as slowness of movements, shaking and gait disturbances. Age is the most consistent risk factor for PD, and as we have an aging population, it is of upmost importance that we find therapies to limit the social, economic and emotional burden of this disease. Most of the studies to find better drugs for PD have been done in rodents. However, many of these drugs failed when tested in PD patients. One problem is that we can only investigate the diseased neurons of the brain after the PD patients have died. We propose to use skin cells from PD patients and reprogram these into neurons and other surrounding cells in the brain called glia. This is a model to study the disease while the patient is still alive. We will investigate how the glial surrounding cells affect the survival of neurons. We will also test drugs that are protective for glial cells and neurons. Overall, this approach is advantageous because it allows for the study of pathological development of PD in a human system. The goal of this project is to identify key molecular events involved at early stages in PD and exploit these as potential points of therapeutic intervention.

Statement of Benefit to California: The goal of this proposal is to create human cell-based models for neurodegenerative disease using transgenic human embryonic stem cells and induced pluripotent stem cells reprogrammed from skin samples of highly clinically characterized Parkinson's Disease (PD) patients and age-matched controls. Given that age is the most consistent risk factor for PD, and we have an aging population, it is of utmost importance that we unravel the cellular, molecular, and genetic causes of the highly specific cell death characteristic of PD. New drugs can be developed out of these studies that will also benefit the citizens of the State of California. In addition, if our strategy can go into preclinical development, this approach would most likely be performed in a pharmaceutical company based in California.